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USTA

United States Telephone Association

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August 13, 1992

Ms. Donna Searcy
Secretary
Federal Communications Commission
1919 M Street - Room 222
Washington, D. C. 20554

Re: Ex Parte Meeting
CC Docket No. 92-101

Dear Ms. Searcy:

On August 13, 1992 Jeff Olson, Mike O'Brien, Joe Mulieri, Peter Neuwirth, Andrew Abel and Frank McKennedy, representing the United States Telephone Association (USTA), met with Chris Frentrup, Michael Mandigo and Dan Grosh of the Common Carrier Bureau regarding the above-referenced docket.

The purpose of the meeting was to review the original Godwins report and the Godwins response to oppositions which have been filed in this docket. The attached written material describing the macroeconomic model used in the Godwins report was distributed and discussed.

An original and a copy of this ex parte notice are being filed in the Office of the Secretary on August 13, 1992. Please include the copy in the public record of this docket.

Respectfully submitted,

Linda Kent

Linda Kent
Associate General Counsel

Attachment

cc: Chris Frentrup
Dan Grosh
Michael Mandigo

Additional Exposition of the Macroeconomic Model used in the Godwins Report

Andrew B. Abel

Part I of Appendix C in the Godwins Report contains a complete derivation of the macroeconomic model used in that report. Below is a list of the equations that must be satisfied by a solution to the model. The general model described in Appendix C applies to any number of sectors. Since the model is implemented as a two-sector model, the equations below are written without using summation notation.

(A4) $P = (\alpha_1{}^{\theta} P_1{}^{1-\theta} + \alpha_2{}^{\theta} P_2{}^{1-\theta})^{1/(1-\theta)}$

(A8) $P_1 C_1 + P_2 C_2 = (\gamma/(1-\gamma))M$

(A15) $N* = \nu(w/P)^{\eta}$

(A16) $Y_i = A_i N_i{}^{\rho_i} K_i{}^{1-\rho_i}$ $\quad i = 1,2$

(A18) $\rho_i P_i Y_i / N_i = wD_i$ $\quad i = 1,2$

(A19) $(1-\rho_i) P_i Y_i / K_i = r$ $\quad i = 1,2$

(A20) $N_1 + N_2 = N^*$

(A21) $K_1 + K_2 = K^*$

(A22) $M = M^*$

(A23) $Y_i = \alpha_i{}^{\theta} (P_i/P)^{-\theta} (\gamma/(1-\gamma))M/P$ $\quad i = 1,2$

(A24) $P_1 Y_1 + P_2 Y_2 = rK* + wD_1 N_1 + wD_2 N_2$

In addition, the solution must satisfy

$C_i = Y_i$ $\quad i = 1,2$

Part II of Appendix C of the Godwins Report describes the calibration of the model. An expanded version of Part II of Appendix C, which is written without summation notation and provides somewhat more detail than the version in the Godwins Report, is appended to the end of this document. Below are lists of input values of variables for (1) the initial calibration of the model; and (2) the calculation of the effect of SFAS 106.

Input variables for the initial calibration:

$\eta = 0.0$

$\theta = 1.5$

$\rho_1 = 0.64$

$\rho_2 = 0.64$

$D_1 = 1.0$

$D_2 = 1.0$

$s^N_1 = N_1/N^* = 0.68$ [used to determine s^Y_i from equation (B4), which is used to determine α_i^θ from equation (B15)]

In addition, there are other inputs to the model that are simply normalizations. None of the important results of the model depends on the values of these inputs.

$\gamma = 0.25$

$N_o^* = 100$ [used to determine ν from equation (B9)]

$K^* = 100$

$A_1 = 1.0$

$P_1 = P_2 = P = 1.0$

Input variables with SFAS 106:

$\eta = 0.0$

$\theta = 1.5$

$\rho_1 = 0.64$

$\rho_2 = 0.64$

$D_1 = 1.0$

$D_2 = 1.03$

$\gamma = 0.25$

$\nu = 100$

$K^* = 100$

$A_1 = A_2 = 1.0$

$M^* = 300$

$\alpha_1^{\theta} = 0.68$

$\alpha_2^{\theta} = 0.32$ [Note that $\alpha_1^{\theta} + \alpha_2^{\theta} = 1$ as required by equation (B13)]

Below are lists of the values of the variables obtained by the model for: (1) the initial calibration of the model; and (2) the calculation of the effects of SFAS 106.

Results of initial calibration:

$N_1 = 68$

$N_2 = 32$

$K_1 = 68$

$K_2 = 32$

$Y_1 = 68$

$Y_2 = 32$

$w = 0.64$

$r = 0.36$

$\nu = 100$

$A_2 = 1.0$

$M^* = 300$

$N^* = 100$

$\alpha_1{}^\theta = 0.68$

$\alpha_2{}^\theta = 0.32$

Results of model with SFAS 106:

$N^* = 100$

$P_1 = 0.994063332$

$P_2 = 1.01304766$

$P = 1.00007984$

$N_1 = 68.8429959$

$N_2 = 31.1570041$

$K_1 = 68.2054725$

$K_2 = 31.7945275$

$Y_1 = C_1 = 68.6128039$

$Y_2 = C_2 = 31.3850263$

$w = 0.634073253$

$r = 0.36$

$M = 300$

private sector fixed-weight price index = 1.0001383
(sector 1 weight = 0.68; sector 2 weight = 0.32)

GNP-PI = 1.0001236
(private sector weight = 0.894; government sector weight = 0.106)

Although Appendix C of the Godwins Report provides derivations of equations, more detailed algebraic derivations are provided below for the following equations:

(a) equation (A10) on page 55
(b) equation (B4) on page 58
(c) equation (B5) on page 58

(a) derivation of (A10) on page 55:

Substituting (A9) into (A7) yields

(R1) $\alpha_i C_i^{-1/\theta} \gamma C^{(1-\theta)/\theta} (1-\gamma) I = (1-\gamma) P_i$

Divide both sides of (R1) by $1-\gamma$ to obtain

(R2) $\alpha_i C_i^{-1/\theta} \gamma C^{(1-\theta)/\theta} I = P_i$

Raise both sides of (R2) to the power $1-\theta$ to obtain

(R3) $\alpha_i^{1-\theta} C_i^{(\theta-1)/\theta} \gamma^{1-\theta} C^{(1-\theta)(1-\theta)/\theta} I^{1-\theta} = P_i^{1-\theta}$

Multiply both sides of (R3) by α_i^{θ} to obtain

(R4) $\alpha_i C_i^{(\theta-1)/\theta} \gamma^{1-\theta} C^{(1-\theta)(1-\theta)/\theta} I^{1-\theta} = \alpha_i^{\theta} P_i^{1-\theta}$

Observe from the definition of P in (A4) that

(R5) $P^{1-\theta} = \Sigma_i \alpha_i^{\theta} P_i^{1-\theta}$

Sum both sides of (R4) over i and use (R5) to simplify the right hand side of the resulting equation to obtain

(R6) $\gamma^{1-\theta} C^{(1-\theta)(1-\theta)/\theta} I^{1-\theta}\ \Sigma_i \alpha_i C_i^{(\theta-1)/\theta} = P^{1-\theta}$

Observe from the definition of C in (A3) that

(R7) $\Sigma_i \alpha_i C_i^{(\theta-1)/\theta} = C^{(\theta-1)/\theta}$

Substituting (R7) into (R6) yields

(R8) $\gamma^{1-\theta} I^{1-\theta} C^{(1-\theta)(1-\theta)/\theta}\ C^{(\theta-1)/\theta} = P^{1-\theta}$

Raise both sides of (R8) to the power $1/(1-\theta)$ to obtain

(R9) $\gamma I C^{(1-\theta)/\theta}\ C^{-1/\theta} = P$

Simplfying the left hand side of (R9) yields

(R10) $\gamma I C^{-1} = P$

Multiplying both sides of (R10) by C yields

(A10) $\gamma I = PC$

(b) derivation of (B4) on page 58: The expanded version of the Appendix at the end of this document contains a more complete algebraic derivation of equation (B4) than is provided in the Godwins Report. This more complete derivation is reproduced below.

Define $s^Y_i = P_iY_i/(P_1Y_1 + P_2Y_2)$ to be the share of total output that is produced in sector i. Multiply both sides of the labor demand equation (A18) by $N_i/(N^*\rho_i)$ to obtain

(B3') $P_iY_i/N^* = wN_iD_i/(N^*\rho_i)$ $\qquad i = 1,2$

Recall that $s^N_i = N_i/N^*$ so that (B3') becomes

(B3'') $P_iY_i/N^* = ws^N_iD_i/\rho_i$ $\qquad i = 1,2$

Now sum (B3'') over sectors 1 and 2 to obtain

(B3''') $(P_1Y_1 + P_2Y_2)/N^* = w(s^N_1D_1/\rho_1 + s^N_2D_2/\rho_2)$

Now divide (B3'') by (B3''') and use the fact that $s^Y_i = P_iY_i/(P_1Y_1 + P_2Y_2)$ to obtain

(B4) $s^Y_i = (D_is^N_i/\rho_i)/(D_1s^N_1/\rho_1 + D_2s^N_2/\rho_2)$ $\qquad i = 1,2$

(c) derivation of (B5) on page 58: The expanded version of the Appendix at the end of this document contains a more complete algebraic derivation of equation (B5) than is provided in the Godwins Report. This more complete derivation is reproduced below.

Multiply both sides of the capital demand equation (A19) by $K_i/(P_1Y_1 + P_2Y_2)$ and divide both sides by r to obtain

(B4') $K_i/(P_1Y_1 + P_2Y_2) = (1-\rho_i)P_iY_i/((P_1Y_1 + P_2Y_2)r)$ $\qquad i = 1,2$

Use the fact that $s^Y_i = P_iY_i/(P_1Y_1 + P_2Y_2)$ to write (B4') as

(B4'') $K_i/(P_1Y_1 + P_2Y_2) = (1-\rho_i)s^Y_i/r$ $\qquad i = 1,2$

Next sum (B4'') over sectors 1 and 2 and recall that $K_1 + K_2 = K^*$ to obtain

(B4''') $K^*/(P_1Y_1 + P_2Y_2) = [(1-\rho_1)s^Y_1 + (1-\rho_2)s^Y_2]/r$ $\qquad i = 1,2$

Divide (B4'') by (B4''') to obtain

(B4'''') $K_i/K^* = (1-\rho_i)s^Y_i/[(1-\rho_1)s^Y_1 + (1-\rho_2)s^Y_2]$ $\qquad i = 1,2$

Multiply both sides of (B4'''') by K^* to obtain

(B5) $K_i = \{(1-\rho_i)s^Y_i/[(1-\rho_1)s^Y_1 + (1-\rho_2)s^Y_2]\}\ K^*$ $\qquad i = 1,2$

The Godwins Report followed a conservative approach in calculating the impact of SFAS 106 on GNP-PI. The guiding principle of the conservative approach is that whenever a choice needs to be made about some variable or some assumption, we use the value of the variable or the assumption that overstates the impact of SFAS 106 on GNP-PI. By following this approach, we can be fairly confident that we have not understated the impact of SFAS 106 on GNP-PI.

The July 1992 Supplemental Report to the Godwins Report pointed to specific examples of choices governed by the conservative approach.[1] In addition, the conservative approach guided the assumptions about how firms and workers view future OPEB payments. One possibility for specifying the model was to assume that everyone in the economy, workers and firms alike, fully understands and takes account of future OPEB payments. In this case, compensation per worker, which includes the present value of future OPEB, would be equalized across sectors. However, in this case, the impact of SFAS 106 on GNP-PI would be precisely zero. Any increase in OPEB in sector 2 would be offset by a decrease in non-OPEB compensation in sector 2.

Rather than choose a set of assumptions that delivered a zero impact of SFAS 106 on GNP-PI, we chose a set of assumptions that would increase GNP-PI, in order to implement a conservative approach. In order for an increase in OPEB not to be offset by a decrease in wages, the firms and/or the workers must not take account of the increase in OPEB. It seemed that the most realistic approach is to assume that (1) after the introduction of SFAS 106 firms fully recognize future OPEB costs as part of total compensation paid to current workers; but (2) workers do not take account of future OPEB benefits (which for the average worker may be more than two decades in the future) in making their labor supply decisions.

One consequence of the assumption that workers ignore future OPEB benefits is that the total compensation package per worker, including OPEB, is higher in sector 2 than in sector 1. However, wages and fringes, excluding OPEB, are equalized across both sectors. A second consequence of this assumption is that the wage rate in sector 2 does not fall as much as it would otherwise, and thus the price level under SFAS 106 is higher than if we had assumed that everyone takes account of future OPEB payments. Therefore, this assumption helps to implement the conservative approach of guarding against understating the impact of SFAS 106 on GNP-PI.

[1]Specific examples of choices governed by this conservative approach are listed for the actuarial analysis in footnote 4, p. 16 and for the macroeconomic analysis on page 32 of the July 1992 Supplemental Report to the Godwins Report.

Expanded version of
"Appendix C, Part II: Calibration of the Model"

[Note: The equations are numbered so that equations that appeared in the original version of the appendix have the same numbers in this version. New equations are numbered with one or more apostrophes or asterisks.]

The model is calibrated so that in the absence of SFAS 106 it yields an allocation of labor across sectors that matches the actual allocation of labor across sectors. It is also calibrated such that in the absence of SFAS 106, all nominal prices are equal to one.

The inputs to the model are:

η, the elasticity of labor supply

θ, the elasticity of substitution between the consumption of any two goods

ρ_1, the share of labor in total cost in sector 1

ρ_2, the share of labor in total cost in sector 2

D_2, the SFAS 106 cost factor in sector 2 (equal to 1 in the absence of SFAS 106)

${s^N}_1 = N_1/N^*$, the fraction of labor employed in sector 1

In addition, there are three other inputs to the model that are simply normalizations. None of the important results of the model depends on the value of these inputs.

γ, the share of nominal expenditure devoted to produced goods

${N_o}^*$, the initial total amount of labor

K^*, the fixed total amount of capital

In the absense of SFAS 106, all nominal prices are set equal to one

(B1) $P_i = 1$ $\qquad i = 1,2$

(B2) $P = 1$

The amount of labor initially used in each sector follows directly from the fraction of the labor force employed in sector i, ${s^N}_i$, and the total amount of labor employed, ${N_o}^*$

(B3) $N_i = {s^N}_i {N_o}^*$ $\qquad i = 1,2$

Define $s^Y_i = P_iY_i/(P_1Y_1 + P_2Y_2)$ to be the share of total output that is produced in sector i. Multiply both sides of the labor demand equation (A18) by $N_i/(N^*\rho_i)$ to obtain

(B3') $P_iY_i/N^* = wN_iD_i/(N^*\rho_i)$ $\quad i = 1,2$

Recall that $s^N_i = N_i/N^*$ so that (B3') becomes

(B3'') $P_iY_i/N^* = ws^N_iD_i/\rho_i$ $\quad i = 1,2$

Now sum (B3'') over sectors 1 and 2 to obtain

(B3''') $(P_1Y_1 + P_2Y_2)/N^* = w(s^N_1D_1/\rho_1 + s^N_2D_2/\rho_2)$

Now divide (B3'') by (B3''') and use the fact that $s^Y_i = P_iY_i/(P_1Y_1 + P_2Y_2)$ to obtain

(B4) $s^Y_i = (D_is^N_i/\rho_i)/(D_1s^N_1/\rho_1 + D_2s^N_2/\rho_2)$ $\quad i = 1,2$

Recall that in the initial equilibrium $D_i = 1$ so that (B4) becomes

(B4*) $s^Y_i = (s^N_i/\rho_i)/(s^N_1/\rho_1 + s^N_2/\rho_2)$ $\quad i = 1,2$

Multiply both sides of the capital demand equation (A19) by $K_i/(P_1Y_1 + P_2Y_2)$ and divide both sides by r to obtain

(B4') $K_i/(P_1Y_1 + P_2Y_2) = (1-\rho_i)P_iY_i/((P_1Y_1 + P_2Y_2)r)$ $\quad i = 1,2$

Use the fact that $s^Y_i = P_iY_i/(P_1Y_1 + P_2Y_2)$ to write (B4') as

(B4'') $K_i/(P_1Y_1 + P_2Y_2) = (1-\rho_i)s^Y_i/r$ $\quad i = 1,2$

Next sum (B4'') over sectors 1 and 2 and recall that $K_1 + K_2 = K^*$ to obtain

(B4''') $K^*/(P_1Y_1 + P_2Y_2) = [(1-\rho_1)s^Y_1 + (1-\rho_2)s^Y_2]/r$ $\quad i = 1,2$

Divide (B4'') by (B4''') to obtain

(B4'''') $K_i/K^* = (1-\rho_i)s^Y_i/[(1-\rho_1)s^Y_1 + (1-\rho_2)s^Y_2]$ $\quad i = 1,2$

Multiply both sides of (B4'''') by K^* to obtain

(B5) $K_i = \{(1-\rho_i)s^Y_i/[(1-\rho_1)s^Y_1 + (1-\rho_2)s^Y_2]\}\ K^*$ $\quad i = 1,2$

Normalize $A_1 = 1$ so that the production function in the first sector is

(B6) $Y_1 = N_1^{\rho_1} K_1^{1-\rho_1}$

Using Y_1 from (B6), the nominal wage can be determined from the labor demand equation (A18) for sector 1 to obtain

(B7) $w = \rho_1 Y_1 P_1/(D_1 N_1)$

Recall that in the initial equilibrium $P_1 = 1$ and $D_1 = 1$ so that

(B7') $w = \rho_1 Y_1/N_1$

Using Y_1 from (B6), the nominal rental price of capital can be determined from the capital demand equation (A19) for sector 1 to obtain

(B8) $r = (1-\rho_1)Y_1 P_1/K_1$

Recall that in the initial equilibrium $P_1 = 1$ so that

(B8') $r = (1-\rho_1)Y_1/K_1$

Now calculate ν in the labor supply curve (eq. A15) as

(B9) $\nu = N_o^*(P/w)^\eta$

Recall that $P = 1$ in the initial equilibrium so that

(B9') $\nu = N_o^*(1/w)^\eta$

To calibrate A_2, substitute the production function (A16) into the labor demand equation (A18) and set $P_i = 1$ (eq. B1) to obtain

(B10) $A_2 = (D_2 w/\rho_2)(N_2/K_2)^{1-\rho_2}$

Recall that $D_2 = 1$ in the initial equilibrium so that

(B10') $A_2 = (w/\rho_2)(N_2/K_2)^{1-\rho_2}$

Now set all prices equal to 1 in the equilibrium condition (A23), and use (A22) to obtain

(B11) $Y_i = \alpha_i^{\theta}(\gamma/(1-\gamma))M^*$

Summing (B11) over i we obtain

(B12) $Y_1 + Y_2 = (\gamma/(1-\gamma))M^* \; (\alpha_1^{\theta} + \alpha_2^{\theta})$

Now observe that with $P = P_i = 1$ for all i, equation (A4) implies that

(B13) $\alpha_1^{\theta} + \alpha_2^{\theta} = 1$

Substituting (B13) into (B12) and rearranging yields

(B14) $M^* = ((1-\gamma)/\gamma) \; [Y_1 + Y_2]$

Finally, substituting (B14) into (B11) and recalling that when $P_i = P = 1$, $s^Y_i \equiv Y_i/[Y_1 + Y_2]$, we obtain

(B15) $\alpha_i^{\theta} = s^Y_i \qquad i = 1,2$